CLAIMS

1. A lighting device for lighting a high-pressure discharge lamp having an outer tube, an interior of which is substantially under vacuum, the lighting device comprising:

a ballast having at least a current limiting element;

a high-voltage pulse generating circuit operable to generate a high-voltage pulse;

a lighting discriminating means operable to discriminate between lighting and non-lighting of the discharge lamp;

a timer circuit operable to set a predetermined period of time; and

a pulse-stop control means operable to stop generation of the high-voltage pulse;

wherein when the lighting discriminating means discriminates non-lighting after lighting has been discriminated, generation of the high-voltage pulse is stopped within the predetermined period of time set by the timer circuit.

2. The lighting device according to claim 1, wherein the discharge lamp further has an arc tube sealed in the outer tube and metallic elements disposed in the outer tube and outside the arc tube, and wherein the predetermined period of time set by the timer circuit is a period of time within which the metallic elements are cooled below a temperature at which no discharge occurs between opposite polarities of the metallic elements.

3. A lighting device for lighting a high-pressure discharge lamp having an outer tube, an interior of which is substantially under vacuum, the lighting device comprising:

a ballast having at least a current limiting element;

a high-voltage pulse generating circuit operable to generate a high-voltage pulse;

a half-wave discharge detecting means operable to detect half-wave discharge of the discharge lamp; and

a pulse-stop control means operable to stop generation of the high-voltage pulse;

wherein when the half-wave discharge detecting means detects half-wave discharge, the pulse-stop control means stops generation of the high-voltage pulse.

4. The lighting device according to claim 3, further comprising a timer circuit operable to set a predetermined period of time, wherein when the half-wave discharge detecting means detects half-wave discharge, generation of the high-voltage pulse is stopped within the predetermined period of time set by the timer circuit.

5. The lighting device according to claim 4, wherein the discharge lamp further has an arc tube sealed in the outer tube and metallic elements disposed in the outer tube and outside the arc tube, and wherein the predetermined period of time set by the timer circuit is a period of time within which the metallic elements are cooled below a temperature at which no discharge occurs between opposite polarities of the metallic elements.

6. The lighting device according to any one of claims 3 to 5, wherein the half-wave discharge detecting means detects a difference in lamp waveform for every half period and determines presence of half-wave discharge when the detected value has exceeded a predetermined value.

7. A lighting device for lighting a high-pressure discharge lamp having an outer tube, an interior of which is substantially under vacuum, the lighting device comprising:

a ballast having at least a current limiting element;

a high-voltage pulse generating circuit operable to generate a high-voltage pulse;

a timer circuit operable to set a predetermined period of time;

a return type cutoff means operable to cut off power supply to the discharge lamp upon detection of an abnormal temperature rise; and

a cutoff detecting means operable to detect cutoff;

wherein the cutoff detecting means detects the cutoff, generation of the high-voltage pulse is stopped within the predetermined period of time set by the timer circuit.

8. The lighting device according to claim 7, wherein the discharge lamp further has an arc tube sealed in the outer tube and metallic elements disposed in the outer tube and outside the arc tube, and wherein the predetermined period of time set by the timer circuit is a period of time within which the metallic elements are cooled below a temperature at which no discharge occurs between opposite polarities of the metallic elements.

9. The lighting device according to claim 7 or 8, wherein the return type cutoff means comprises a thermal protector.

10. The lighting device according to any one of claims 1 to 9, wherein the lighting discriminating means or the half-wave discharge detecting means or the cutoff detecting means is reset with power cutoff.

11. The lighting device according to any one of claims 1, 2, and 4 to 10, wherein the timer circuit comprises a microcomputer.

12. A lighting equipment having a lighting device according to any one of claims 1 to 11.